Theses, Dissertations and Culminating Projects

8-2023

The Relationship Between Poverty and Behavior Problems : Examining the Role of Family and Parental Factors from an Ecological Systems Perspective

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The Relationship between Poverty and Behavior Problems: Examining the Role of Family

and Parental Factors from an Ecological Systems Perspective

A DISSERTATION

Submitted to the Faculty of

Montclair State University in partial fulfilment

of the requirements

for the degree of Doctor of Philosophy

by

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June 2023

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MONTCLAIR STATE UNIVERSITY

THE GRADUATE SCHOOL

DISSERTATION APPROVAL

We hereby approve the Dissertation

The Relationship between Poverty and Behavior Problems: Examining the Role of Family and Parental Factors using an Ecological Systems Perspective
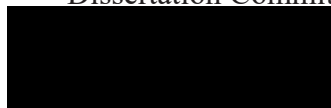
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Candidate for the Degree:

Doctor of Philosophy

Graduate Program:

Clinical Psychology

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8/16/23

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Abstract

The large number of children from low-income households or living in poverty are at increased risk for a range of negative outcomes, including behavior problems. The Family Stress Model is a framework that can be used to describe how poverty may shape the development of behavior problems through its influence on family processes, including parental mental health, parenting, and household environment. While the Family Stress Model has been widely replicated, studies have rarely examined the context of infancy and toddlerhood, during which family-related processes tend to be more impactful in child development. Therefore, the present study evaluated two adaptations of the Family Stress Model in a large, ethnically diverse sample of Early Head Start families (N= 2,835). Specifically, the present study investigated whether poverty, in the form of economic hardships and pressures, contributes to behavior problems in infancy and toddlerhood indirectly through its impact on four family-based risk factors (parental depression, household chaos, parenting stress, and parental sensitivity), as well as whether these factors operate independently or indirectly through parental sensitivity. Results indicated that parental depression, parenting stress, and household chaos mediated relations between economic pressure and parental sensitivity, and that parenting stress and household chaos, but not parental depression, were associated with child behavior problems indirectly through parental sensitivity. Social support was also identified as a buffer against the negative effect of economic pressure on parental depression. Implications for future Family Stress Model research with Early Head Start families, as well as for prevention and intervention approaches, are discussed.

Keywords: poverty, early head start, child behavior problems, parenting

Contents

Introduction

Among children in the United States, 38% are living in low-income households, defined as having income from household wage-earners below 200 percent of the federal poverty threshold of $26,000 (for a family with two adults and two children). Approximately one in five additional children are living in poverty, with household incomes at or below 100 percent of the federal poverty threshold. Children are overrepresented among individuals living in poverty, accounting for 29 percent of the population but comprising 32% of those in poverty (National Center for Children in Poverty, 2021).

The substantial number of children from low-income households and living in poverty are at increased risk for a host of negative outcomes related to economic, educational, occupational, physical, and behavioral functioning. In 2013, it was estimated that child poverty costs the United States approximately $500 billion yearly in reduced economic output and expenses related to the criminal justice system (Coley & Baker, 2013). Academically, children from low-income families often begin school behind their peers and fall further behind over the course of their schooling. On average, they enter kindergarten less linguistically developed than their peers and score lower on national achievement tests of reading and mathematics (Hochschild, 2003), and this disparity increases as household income moves closer to the poverty threshold (Smith et al., 1997). Consistent with this, children living in poverty are more likely to experience cognitive deficits, including difficulties related to attention, communication, and vocabulary, which may be related to atypical brain development associated with early economic disadvantage (Bradley & Corwyn, 2002). In the long term, children living below the poverty line are at greater risk for grade repetition and dropping out of high school (Duncan & Brooks-Gunn, 2000) and go on to work less and earn less than children from affluent backgrounds, particularly

when poverty is experienced during early childhood (Duncan et al., 2010; Duncan et al., 2012).

Regarding physical health, children living in poverty are at greater risk of hospitalization, low

birthweight, lead poisoning, and child mortality compared to peers not living in poverty (Brooks-

Gunn & Duncan, 1997).

Poverty and Behavior Problems

Poverty has also been consistently associated with increased risk of childhood behavior

problems, with several meta-analyses demonstrating small but significant effects for

internalizing (e.g., depression and anxiety; Korous et al., 2018), externalizing (e.g., aggression

and defiance; Peverill et al., 2020), and antisocial behavior (e.g., lying and stealing; Piotrowska

et al., 2015). For example, Holtz et al. (2015) examined the incidence of behavior problems in a

sample of 357 children under the age of five whose family income met the federal poverty

threshold. They found that 17.4% of these children scored one standard deviation above the

mean for challenging behaviors, defined as non-compliance, severe tantrums, and property

destruction. In a sample of 753 children ranging from ages three to five, lower family income

level and greater income instability (i.e. the proportion of years in which the family experienced

a 30% or more decrease in total family income in the prior year) were associated with higher

levels of externalizing problems (Yueng et al., 2002). Similarly, low socioeconomic status was

associated with an increased risk of all mental health problems in a large sample of preadolescent

children (ages 10-12; $N = 2,230$), with the greatest increases in risk for aggression, delinquency,

attention, and externalizing problems (Amone-P'Olak et al., 2009).

Findings from longitudinal studies also suggest that children from lower income families

tend to experience more behavior problems over time. For example, in a sample of 341 children

living in rural areas in the northeastern United States who were assessed at ages 8-9, 13, 17, and

24, exposure to poverty was associated with relatively high levels of internalizing problems that decreased more slowly over time, relatively high levels of externalizing problems that increased more quickly over time, less task persistence (suggesting greater learned helplessness), and higher levels of chronic physiological stress (Evans & De France, 2022). Similarly, children who participated in the NICHD Study of Early Child Care and Youth Development from age two through first grade ($N = 1,132$) exhibited fewer behavior problems when family income was relatively high compared to when family income was relatively low. Findings also showed that children who were chronically poor (i.e. had a family income to needs ratio at or below 1.0 at three or more time points) exhibited more behavior problems over time than children who were never poor (Dearing et al., 2006).

Data from the National Longitudinal Study of Youth (NLSY) also underscores the prospective associations between poverty and behavior problems. For example, based on a sample of children ages 4-14 ($N = 7,143$) from the NLSY, Stroschein (2005) found that higher initial household income was associated with lower initial levels of child antisocial behavior and depression, and that improvements in income over time were linked to reduced symptom levels. Additionally, the effect of initial household income on antisocial behavior became stronger over time. Another analysis of NLSY data focusing on African American children ($N = 591$) revealed that income during early childhood had a direct effect on behavior problems in middle childhood, such that lower income levels were associated with higher levels of behavior problems (Nievar & Luster, 2006).

Two other large longitudinal studies are also important to note. A Canadian sample from the 1998-2006 waves of the Quebec Longitudinal Study of Child Development ($N = 2,120$) demonstrated that children living in poverty had higher overall levels of behavior problems

between 1.5 and 8 years of age and that poverty predicted certain types of behavior problems in a time-dependent manner. Specifically, for children living in poverty compared with those who were not, hyperactivity and oppositional behaviors increased at a faster rate until age five, and then decreased more slowly (Mazza et al., 2016). Furthermore, findings from the second, third and fourth waves of the Millennium Cohort Study ($N = 17,541$) indicated that economic hardship, conceptualized as income poverty, material deprivation, and subjective financial distress (the financial, material, and psychological dimensions of poverty, respectively) were associated with higher levels of behavior problems. The combination of material deprivation and subjective financial stress, and the combination of all three dimensions together, were also linked to the highest level of behavior problems (Schenck-Fontaine & Panico, 2019).

Additionally, a growing body of research has demonstrated that poverty is strongly associated with adverse childhood experiences (ACEs; Steele et al., 2016). Children living in poverty are more than twice as likely to experience three or more adversities, which increases risk for the development of behavior problems (Anda et al., 2010; Clarkson Freeman, 2014). Many of the adversities that occur in childhood are rooted in economic insufficiency (Evans & Kim, 2013). In ACE studies, poverty has been conceptualized as being part of a negative feedback loop in which adverse conditions accumulate and worsen. Specifically, poverty contributes to family stressors and dysfunction, which can lead to further adversities that affect cognitive functioning and increase risk for behavioral and emotional problems that, in turn, give rise to additional stressors and strain on the family. Consistent with this framework, a longitudinal study of 2,750 children and their parents living in urban poverty found that children who had experienced multiple ACEs prior to age three were at significantly greater risk for being in the top 10th percentile for behavior problems at ages 3, 5, 9, and 15 (Choi, Wang, & Jackson,

2019). This finding underscores how children living in poverty can experience adversity, such as family stressors, that can have a long-term impact on their psychosocial functioning.

Because of poverty's significant and enduring impact on socioemotional development, it has long been a critical target for early intervention. To further our understanding of how to address the effects of poverty, previous research has focused on illuminating the complex array of risk and protective factors that help explain how poverty shapes trajectories toward children's behavior problems. Theoretical models that examine mechanisms of the relationship between poverty and behavior problems have been developed and evaluated. Some of these models conceptualize this relationship as stemming from proximal factors that act directly on the child (e.g., parenting) as well as more distal, broader, and contextual factors (e.g., socioeconomic status). However, gaps in our understanding remain. Fewer studies have explored the impact of poverty on risk and protective factors during infancy and toddlerhood, which is a critical time for establishing neural functions and structures that shape cognitive, social, emotional, and physical development (Knudsen et al., 2006; Sapolsky, 2004). The following sections of this introduction will highlight and describe theoretical models linking poverty to the development of behavior problems in infants and toddlers, review empirical support for these models, and explain how the proposed study will expand upon this prior work.

Theoretical Foundations

Ecological Systems Theory

The impact of poverty on children's development can be conceptualized through an Ecological Systems Theory framework (Bronfenbrenner 1979, 1986). According to this theory, child development is a diverse and complex process that is influenced by the transaction between children's characteristics and the environments in which they develop. The environmental

context is conceptualized as a set of nested systems in which the child is embedded. These systems range from proximal to distal, with the proximal most directly influencing the child's development, and include the microsystem, mesosystem, exosystem, and macrosystem. The microsystem is the most proximal and is defined as the immediate environment in which the child lives, including family, school, and peer influences. The mesosystem describes the interrelationships between the different microsystems. For example, a parent attending a parent-teacher conference at the child's school may help improve the child's academic functioning because, even though the parent and teacher belong to different microsystems (family and school, respectively), the parent's involvement in the child's schooling may communicate to the child that academic performance is something to be valued. The exosystem is an environment in which the child does not participate but can have an impact on the child through its effects on other systems (e.g., events at a parent's workplace may influence how the parent interacts with their child at home). The macrosystem, the most distal in relation to the child, represents societal factors, including cultural values, the economic conditions under which families live, access to material resources, and opportunity structures which guide how the other systems operate. Because these systems are nested and interrelated, it is possible to examine how patterns of interactions within these systems shape one another and influence developmental outcomes.

Through the lens of Ecological Systems Theory, poverty can be viewed as being associated with negative consequences within multiple systems that play important roles in shaping developmental pathways to childhood behavior problems (Brofenbrenner, 2005). At the macrosystem level, socioeconomic status has been associated with children's socioemotional competence (Barajas, Philipsen, & Brooks-Gunn, 2008) and the development of behavior problems (Anthony, Anthony, Morrel, & Acosta, 2005). These associations may be explained by

economic policies that constrain resources and prevent upward mobility. Rising costs of attending colleges and universities prevent parents from attaining the education necessary to receive pay increases, lack of affordable healthcare prohibits parents and children from accessing the physical and mental healthcare they need, and no requirement for paid family leave means that new parents must return to work sooner rather than spending time with their children (Reeves & Krause, 2019). At the exosystem level, caregivers spend more hours at work away from their families and work more volatile schedules that require them to be on-call and work irregular shifts to earn enough to support basic needs (Smith & Halpin, 2014). These irregular schedules can make it difficult for parents to spend time with their children and set consistent routines, which can contribute to the development of behavior problems (Pilarz, 2021).

Within the microsystem, children growing up in poverty are exposed to variety of risk factors in their neighborhoods and homes that are pervasive and accumulate over time (Li, Godinet, & Arnsberger, 2011). For example, they tend to live in neighborhoods that are more crowded and have fewer resources, such as parks and greenspaces, municipal services (e.g., fire department, garbage disposal), and grocery stores (McBride Murry, 2011). A lack of these kinds of resources can decrease community involvement and create a negative social climate, which has been shown to increase risk of behavior problems in children (Caughy et al., 2008). A study by Bruner (2017) showed that this lack of resources might have a particularly strong impact on young children, as children under the age of five account for a much higher percentage of the population in neighborhoods with increased child poverty rates. They also found that, as the neighborhood child poverty rate increases from under 10% to over 50%, the proportion of young children in the population increases from 5.9% to 8.6%, reflecting an overall increase of 46%. In addition, the family environment is also affected by poverty, as households with lower incomes

tend to be more crowded and have more conflict (Melki, Beydoun, Khogali, Tamim, & Yunis, 2004), and the instability resulting from this type of environment has been linked to the development of behavior problems (Cox & Brooks-Gunn, 1999; Ramos et al., 2005). Because families living in poverty are affected by numerous stressors, it is imperative to understand the mechanisms through which these stressors are associated with one another and shape the development of behavior problems in infants and toddlers.

Family Stress Model

The Family Stress Model is an application of Ecological Systems Theory that emphasizes the role of family processes in shaping pathways from poverty to children's development of behavior problems. Developed by Conger and Elder (1994), the Family Stress Model defines poverty as being characterized by economic hardships, which are measures of income and negative financial events (e.g., increasing economic demands, recent income loss, and work instability), and economic pressures, which are daily strains and hassles created by unstable economic conditions (e.g., not being able to afford rent or material needs, such as food and clothing). In this model, economic hardships give rise to economic pressures, which precipitate high levels of family stress reflected in increased parental psychological distress (e.g., depression, anxiety), a less stable family environment, and decreases in nutritive and supportive parenting (all of which are associated with the microsystem as defined in Ecological Systems Theory). In turn, this stress is proposed to be associated with higher levels of behavior problems in children (Masarik & Conger, 2017). The model also includes risk and protective factors (e.g., family conflict, social support) that can moderate the direct and indirect pathways between each of the components of the model.

Four systematic reviews have evaluated empirical investigations of the Family Stress Model (Barnett, 2008; Conger & Conger, 2002; Conger et al., 2010; Masarik & Conger, 2017). In the first systematic review, Conger and Conger (2002) reviewed research findings from the first ten years of the Iowa Youth and Families Project, a longitudinal study of the Family Stress Model that assessed 558 Iowa seventh graders annually from 1989 to 1992 and again in 1994 (senior year of high school), 1995, 1997, and 2000. Overall, parents were found to have the greatest resilience to economic hardship when they were supported by their partner, displayed effective problem-solving skills, and had a sense of self-confidence and mastery that ultimately led them to reduce the amount of economic pressure they were experiencing. These processes also improved the quality of parenting and support they provided to their children. When parental nurturance and supportiveness were high, children had lower levels of emotional and behavior problems during adolescence.

Barnett (2008) reviewed subsequent findings and demonstrated that the Family Stress Model was applicable to racially and ethnically diverse families and those living in urban settings, though it was noted that the model needed to be examined with younger children. Conger et al. (2010) found further evidence for replication of the model in ethnically diverse samples, described support for expanding the model to include neighborhood stressors, and included studies examining moderators of Family Stress Model pathways. As most of the studies in their review utilized cross-sectional designs, the authors recommended that future studies utilize longitudinal designs to examine causal pathways and more detailed examination of moderators. In the most recent review, Masarik and Conger (2017) described the evolution of the Family Stress Model in several domains, including the addition of new explanatory pathways

(e.g., impact of acculturative stressors for ethnic minority populations), factors that may

moderate these pathways, and the emergence of more longitudinal investigations of the model.

  Further support for the Family Stress Model was provided by a recent longitudinal study

of a population-based sample of children ($N = 2,918$) assessed at multiple time points from birth

until age nine (Gard et al., 2020). Findings indicate that family income to needs ratio at birth and

biological mother relationship status (single or cohabiting) significantly predicted economic

pressure in families of children assessed at age one. Greater economic pressure at age one

predicted greater maternal distress at age three and, in turn, predicted lower observed maternal

warmth and greater maternal harshness at age five. Low maternal warmth and high maternal

harshness at age five each uniquely predicted greater child externalizing and internalizing

behaviors at age nine. This study adds to our understanding of the Family Stress Model by

showing the impact of economic hardship on parenting behaviors and behavioral problems

across developmental periods within the first decade of life.

  However, gaps remain in our understanding of mechanisms within this model. Much of

the literature has focused on examining mediating pathways within the Family Stress Model

framework without considering how these pathways may vary by the presence of potential

protective factors, such as levels of social support. Additionally, much of the evaluation of the

Family Stress Model has been conducted in children during middle childhood and adolescence.

Within these developmental periods, peer and neighborhood influences become more salient,

which can dampen the relative impact of family processes on youth outcomes (Smetana et al.,

2006). In contrast, much of development during infancy and toddlerhood occurs within the

context of the family. Therefore, family-related influences on development may have greater

effects earlier in childhood. Indeed, meta-analyses have shown stronger associations between

maternal depression, parenting behaviors, and multiple dimensions of child psychopathology among younger children than adolescents (Goodman et al., 2011; Hoeve et al., 2009).

Mechanisms of the Effects of Poverty on Behavior Problems

According to the Family Stress Model, there are three family-related domains through which poverty influences child adjustment: the home environment, parental psychological distress, and parenting behaviors. The following sections will review the literature regarding one commonly studied factor within each of these domains (household chaos, parental depression, and parenting stress, respectively) that may serve to connect the effects of poverty to the development of behavior problems in infants and toddlers.

Household Chaos

As noted previously, poverty can have important consequences for a child's microsystem, a key component of which is the home environment. For example, household chaos, defined as disorganization, confusion, clutter, and ambient noise within the home, is experienced more often by families living in poverty (Evans et al., 2005; Evans, Eckenrode & Marcynyszyn, 2010; Lichter & Wethington, 2010). As families living in poverty often have less access to resources, parents may be forced to spend less time interacting with their children in favor of working, commuting, and transporting their children to and from various childcare settings and activities (Hseh & Yoshikawa, 2007). This can contribute to an increasingly hectic, unstructured, and unpredictable home environment, which has been linked to numerous negative outcomes for children, including the development of behavior problems (see Marsh et al., 2020 for a review).

Evidence suggests that household chaos is associated with higher levels of behavior problems in children and may mediate the relationship between lower SES and behavior problems. For instance, a cross-sectional study of 106 mother-child dyads found that household

chaos was associated with elevated levels of anger and aggressive behaviors (Dumas et al., 2005). Similarly, a study of 120 mother-son dyads found that household chaos at ages two and three was associated with an increase in behavior problems between the ages of five and six (Supplee et al., 2007). Additionally, an online survey of parents of children between ages two and five found an association between household chaos and child externalizing behavior that was mediated by child and family routines (Larsen & Jordan, 2020). Moreover, a longitudinal study of 731 mother-child dyads recruited from Women Infants and Children Nutritional Supplement Centers in rural, suburban, and urban locations found that household chaos mediated the relationship between SES and emotional problems. Specifically, lower SES between ages two and three predicted higher levels of chaos between ages four and five, which, in turn, predicted higher levels of emotional problems at ages seven and eight (Shelleby et al., 2014). While these studies provide support for associations between household chaos and behavior problems, they also suggest that household chaos may serve as a mechanism to explain the link between poverty and behavior problems.

Household chaos is believed to contribute to the development of behavior problems in multiple ways. For example, children who experience a lack of routines and structure, as well as unpredictable and inconsistent surroundings, may not develop effective coping and self-regulation skills and instead feel they lack control over their environment. The impact of household chaos on parenting behaviors and the quality of the parent-child relationship may also have an effect on child adjustment. Chaotic home environments are prone to interruptions, making interactions between parents and children less predictable. As shown by Coldwell et al. (2006), household chaos has been positively associated with caregiving that is less responsive, less involved, and more likely to interfere with exploration. Household chaos has also been

linked to the development of behavior problems indirectly through parenting behaviors. In a longitudinal study of 1,292 infants and toddlers assessed at five time points between two and 36 months of age, maternal sensitivity and harsh-intrusive parenting were found to mediate the association between household chaos and child conduct problems (Mills-Koonce et al., 2016).

Parental Depression

Studies suggest that that individuals living in poverty are two to five times more likely to experience diagnosable mental health problems, such as depression, than the highest SES group (Bourdon et al., 1994; Regier et al., 1993). Parents living in poverty may be at even greater risk for developing mental health problems, such as suicidal ideation (Austin & Shanahan, 2021). Among mothers, depression is among the most commonly reported problems, with mothers living in poverty being four times more likely to report depressive symptoms than their middle-income counterparts (Chaudron, et al., 2004). It is perhaps not surprising that poverty is linked with parental depression, as poverty presents a variety of challenges that can be taxing on the mental health of parents, including greater stress, less social support, and effects of unemployment (Baker & North, 1999; Hope et al, 1999).

It has also been well established that parental depression is associated with increased risk of childhood emotional and behavior problems. Compared to mothers without depression, depressed mothers are three times more likely to have children with emotional problems (Weissman et al., 2004). Moreover, a meta-analysis of 193 studies examining children ages nine days to 20 years found that maternal depression was linked to significantly higher levels of internalizing, externalizing, and general psychopathology, and that children with depressed mothers were more likely to display higher levels of negative affect and lower levels of positive affect (Goodman et al., 2011). Relatedly, improvements in parents' depressive symptoms

through treatment have been shown to improve psychological symptoms in their children

(Gunlicks & Weissman, 2008).

Of note, a longitudinal study of 7,429 mother-child dyads demonstrated that mothers

diagnosed with depression (when their children were 21 months old) had increased odds of

having a child with internalizing or externalizing problems at age 7.5. Interestingly, it was shown

that children of mothers with depression were more likely to be exposed to various risk factors

related to their environment (e.g., low socioeconomic status), family (e.g., low emotional and

practical support), and lifestyle (e.g., criminal involvement with the police). This suggests that

parental depression may influence the development of children's behavior problems indirectly.

One proposed pathway is through parenting behaviors, as evidence suggests that parents who are

depressed may be less warm and engaged with their children; in turn, this lack of warmth and

engagement may contribute to symptoms of childhood depression (Baker, 2018).

Research has also provided support for the mediating role of parental depression in the

link between poverty and child behavior problems. For example, maternal depression has been

found to mediate relations between economic deprivation and behavior problems in a sample of

children between the ages of two and four (Wadsworth et al., 2013) and between poverty and

behavior problems among children ages two to three years (Shaw et al., 2009). Similarly,

maternal depression was shown to mediate the relationship between poverty and physical

aggression and hyperactivity in children between 1.5 and five years old (Mazza et al., 2017).

However, further study is needed to understand the role of maternal depression as a mechanism

of the relationship between poverty and behavioral problems in the context of other family and

parental processes.

Parenting Stress

Parenting stress has been found to be elevated among families living in poverty (Raphael et al., 2010). Parents may understandably experience significant challenges around caregiving amidst pressures from trying to support their families on limited resources. Defined as an aversive psychological reaction to the demands of being a parent, parenting stress includes three major components: dysfunctional interactions, parenting distress, and child difficulties. Dysfunctional interactions occur when parents perceive that their children do not meet their expectations, and their interactions with their children are not reinforcing to their role as a parent. Parenting distress refers to a lack of confidence and feeling of discomfort in the parent role, whereas child difficulties occur when children exhibit behaviors that parents perceive as difficult to manage.

Parenting stress has been linked directly with child behavior problems (Neece et al., 2012), as well as indirectly through its association with negative, harsh, and less sensitive parenting behaviors (Abdin, 1990; Deater-Deckard & Scarr, 1996). Evidence also suggests that this indirect pathway may help illuminate the relationship between poverty and children's behavior problems. For example, based on a sample of 1,370 children assessed four times between ages three and 15, Jackson and Choi (2018) reported that maternal depressive symptoms and parenting stress mediated the relationship between economic hardship and harsh parenting, which predicted higher levels of child behavior problems. This was also found when examining a subset of 748 Black boys from this sample (Jackson, Choi, & Preston, 2019). In contrast, a study of 229 children ages two to six years attending Head Start programs did not find that parenting behavior mediated the relation between parenting stress and child internalizing and externalizing problems. Instead, there was a main effect of parenting stress on internalizing and externalizing

problems (Anthony et al., 2005), providing support for a direct effect model. Additional support for a direct effect model was found in a three-wave longitudinal study of 441 adolescents and their parents. While maternal and paternal parenting stress were associated with internalizing and externalizing problems when observed concurrently at age 13, and maternal parenting stress at age 13 was found to predict externalizing problems at age 18, parenting behaviors (specifically, overactivity and warmth) at age 15 did not mediate the relationship between parenting stress and externalizing behaviors (deMaat et al., 2021). Therefore, it remains uncertain whether relations between poverty, parenting stress, parenting behaviors, and the development of child behavior problems are comprised of direct or indirect pathways.

The Role of Parental Sensitivity

Research has shown an association between socioeconomic status and parenting behaviors, with several studies suggesting that parents living in poverty are less likely to engage in warm, supportive parenting. For instance, mothers living in poverty tend to display higher levels of emotional unresponsiveness and provide their children with fewer stimulating experiences (Eamon, 2000; Linver et al., 2002). This may be because poverty increases parents' exposure to negative life events and stressors that reduce their capacity to provide sensitive and responsive parenting (McLoyd, 1998). In addition, parenting behavior has been shown to mediate the relationship between poverty and behavior problems. For example, in a study of 1,070 children between ages two and six, poverty was associated with behavior problems indirectly through less-supportive parenting and family conflict (Rafferty & Griffin, 2010). In a study of 2,232 children between ages five and 12, maternal warmth and parental monitoring were found to mediate the association between neighborhood affluence and antisocial behavior (Odgers et al., 2012). Parental overprotection (assessed at 1.5 and 2.5 years of age) was also

shown to mediate the relationship between poverty (assessed four times between 5 months and 3.5 years of age) and trajectories toward high physical aggression and hyperactivity (assessed five times between 1.5 and five years of age) in a longitudinal sample of 1,759 children (Mazza et al., 2017).

Defined as the ability to perceive child signals, interpret them correctly, and respond promptly and appropriately (Ainsworth, Blehar, Waters, & Wall, 1978), parental sensitivity is one aspect of parenting believed to be critically important in understanding parenting behaviors in the context of poverty and family stress. It has some overlap with two commonly studied dimensions of parenting behavior: parental warmth, which reflects high sensitivity (e.g., the parent is supportive and attentive to their child's needs), and overcontrol, which reflects low sensitivity (e.g., the parent is restricting the child's autonomy). Parental sensitivity also appears to be a key quality of effective parenting that may reduce risk for children's behavior problems. For example, children with sensitive and nurturing caregivers in early childhood have been found to exhibit fewer behavior problems and be more likely to be prosocial and succeed in school (see review by National Research Council and Institute of Medicine, 2009). Similarly, high parental sensitivity appears to protect children with high negative affect from developing externalizing problems (Crockenberg et al., 2008). It is possible that parents who respond to their children's negative emotions in a sensitive way may help their children learn to self-regulate. Consistent with this, parental supportiveness (a dimension of sensitivity) has been associated with emotion regulation skills in toddlers, and the rate of growth in parents' supportiveness appears to predict the rate of growth of children's emotion regulation skills (Bockneck, et al., 2005).

However, some evidence suggests that parents living in poverty may have lower parental sensitivity. A systematic review of 27 studies indicated that parents who endured a lot of stress

tended to be compromised in their ability to provide sensitive and positive parenting, which in turn predicted an increased risk of behavior problems. This effect was found to be particularly strong for parents reporting low socioeconomic status, as they were prone to experiencing high levels of stress related to providing for their family's basic needs. In contrast, having high parental sensitivity despite these challenges was associated with lower levels of behavior problems in children (Mesman et al., 2012). In support of these findings, a more recent longitudinal study of 253 socioeconomically diverse mother-child dyads found that socioeconomic risk at age 3.5 predicted lower baseline and greater reductions in sensitivity at age five (Sturge-Apple et al., 2017).

Because parental sensitivity involves an exchange between the parent and child, it can be considered more proximal to the child's development than other family factors present at the microsystem level. Therefore, it may take on a unique role and serve as a mechanism through which more distal family factors, such as household chaos, parental depression, and parenting stress, influence behavior problems. To date, two studies have explored the mediating role of parental sensitivity. First, Yu et al. (2021) examined longitudinal relations among poverty, maternal sensitivity, and child self-regulation abilities in a community sample of 359 low-income African American and Latina mothers and their children, who were assessed between ages 2.5 and seven. Findings indicated that, for Latino children, more frequent exposure to poverty was associated with slower growth in behavioral self-regulation ability, and this relationship was partially mediated through less sensitive and supportive parenting (only direct effects were observed among African American mother/child dyads). This suggests that poverty may influence self-regulation directly and indirectly through parental sensitivity.

Second, Whittaker et al. (2011) investigated the role of parental sensitivity within the context of other family factors in a sample of 114 mother-child dyads recruited from Early Head Start programs. They found that maternal sensitivity mediated the pathway from parenting stress to child social/emotional functioning but did not mediate the pathway from maternal depression to social/emotional functioning. Additionally, no direct effects from maternal depression or parenting stress to child social/emotional functioning were found. Therefore, while Yu et al (2021) and Whittaker et al. (2011) provide preliminary evidence for parental sensitivity as a proximal factor through which poverty, along with other family/parental factors, may influence the development of behavior problems, further research is needed to clarify the role of parental sensitivity in the relationship between poverty and child behavior problems and examine how it is influenced by other family and parental processes.

Potential Moderators: Social Support and Parent-Child Closeness

In addition to examining mechanisms of the relationship between poverty and behavior problems, it is important to understand factors that may affect the strength of these pathways. Social support may be one such factor. As noted previously, economically disadvantaged parents often experience environments characterized by chaos, lack of control, and high levels of stress that can increase their risk of depression. Therefore, resources that provide them with support may be critical for helping them cope and avoid experiencing depressive symptoms. Consistent with this, it is well established that social support is associated with lower levels of depressive symptoms in both lower and higher income families (Bost et al., 2002; Cairney et al., 2003).

To date, three studies have examined social support as a moderator of the relationship between poverty and parental depressive symptoms, with only one finding evidence of moderation. First, in a study of 3,675 low-income mothers assessed once yearly for five years,

greater numbers of economic hardships were found to predict higher levels of depressive symptoms, while social support in the form of instrumental support (e.g., providing tangible support, such as loaning money or providing childcare) and partner support were found to predict lower levels of depression. However, no interactive effects were found for social support in the relation between poverty-related stress and maternal depressive symptoms (Manuel et al., 2012). Similarly, in a population-based sample of 921 Norwegian mothers with 18-month-old children, negative life events and chronic strain predicted higher levels of depressive symptoms, and social support was associated with lower symptoms; however, no interaction effects were found (Mathiesen et al., 1999). However, in a study of 200 African American mothers and adolescents, kin social support was found to moderate the relation between financial pressure and maternal depressive symptoms, such that the association between financial pressure and maternal depressive symptoms was weakened for mothers with higher levels of kin support (Taylor et al., 2012). Therefore, while some evidence suggests that social support has an impact on levels of parental depression, further research is needed to determine if social support is protective against the negative effects of poverty.

A concept related to social support, parent-child closeness, may also buffer the impact of a chaotic family environment on the development of behavior problems. As previously discussed, household chaos may contribute to behavior problems through reduced quality and quantity of parent-child interactions. However, if parents remain close with their children and foster a healthy and nurturing parent-child relationship, they may be able to effectively guide their children's development, allow them to explore their world with a sense of emotional security, and provide them with the tools necessary to navigate environmental confusion within the home (Morris et al., 2017). To date, research regarding the role of parent-child closeness in

child development is limited. Therefore, it remains unclear whether parent-child closeness might

serve to buffer the effects of poverty and household chaos on the development of behavior

problems early in childhood, and so further research is needed to examine these relationships.

Aims and Hypotheses

The present study sought to investigate the effects of poverty on behavior problems in a

low-income sample of children and families participating in Early Head Start programs. It aimed

to expand on previous research that has framed the effects of poverty on child behavior problems

within the Family Stress Model. Specifically, this study examined whether poverty, in the form

of economic hardships and pressures, contributes to behavior problems in infancy and

toddlerhood indirectly through its impact on four family-based risk factors: parental depression,

household chaos, parenting stress, and parental sensitivity. As parental sensitivity is viewed as

the most proximal of the four family-based risk factors concerning children's direct experiences,

this study used the lens of Ecological Systems Theory to examine parental sensitivity as a

potential mediator through which the other three risk factors contribute to behavior problems.

Additionally, this study examined whether two variables, parental social support and parent-child

closeness, moderate the effects of poverty on parental depression and household chaos on

behavior problems, respectively. Hypotheses included the following:

1) Economic hardship would be associated with economic pressure, which, in turn, would

be associated with three proximal risk factors (parental depression, parenting stress, and

household chaos)

2) The proximal risk factors would have a direct association with parental sensitivity

3) The proximal factors would be indirectly related to the development of child behavior

problems through parental sensitivity

4) The pathway from economic pressure to parental depression would be moderated by parental social support, such that parents experiencing high levels of economic pressure would experience lower levels of depressive symptoms in the presence of high levels of social support

5) The pathway from household chaos to parental sensitivity would be moderated by parent-child closeness, such that, for children experiencing high levels of household chaos, parent-child closeness would have a protective effect and be associated with higher levels of sensitivity, which, in turn, would predict lower levels of behavior problems.

6) An additional, alternative model will be tested and compared to the hypothesized model to determine if the proximal risk factors independently contribute to the development of child behavior problems or act indirectly though parental sensitivity. In this model, parental depression, parenting stress, household chaos, and parental sensitivity act directly on child behavior problems. This contrasts with the hypothesized model, which proposes that the proximal factors act indirectly through parental sensitivity. It is expected that the hypothesized model will have a better fit to the data.

This study builds on the literature in several ways. While research has examined the impact of each of these proximal risk factors individually on the relationship between poverty and behavior problems, few studies have explored models examining their relative contributions. In addition, as much of the literature related to the Family Stress Model has focused on school-age children and adolescents (Masarik & Conger, 2017), this study examined these processes in a younger sample of infants and toddlers for whom family and parental factors may be more influential on social/emotional development. Finally, by helping elucidate relationships between poverty, family processes, and behavior problems, results from this study may inform

approaches to the prevention and early intervention of behavior problems in children from low-income families by identifying targets for intervention within the family system.

Methods

Data Source

The current study was conducted as a secondary analysis of data collected as part of the Early Head Start Family and Child Experiences Survey (Baby FACES), a cross-sectional dataset providing information about children, families, and staff participating in the Early Head Start (EHS) program. To secure access to the data, a restricted data use agreement was signed, and an exemption was received from the university's Institutional Review Board (IRB). Baby FACES includes a nationally representative sample of the EHS population selected through a stratified clustered sampling strategy. A total of 137 EHS programs were involved in this study.

Participants

A total of 2,835 children and their parents participated in the study. One parent in each household was the designated respondent, and respondents were primarily mothers (78.1%). The sample was composed of 1478 boys (51.9%), and racial/ethnic composition included the following: 17.2% identified as White, 22.2% African American, 33.9% Hispanic, 0.7% American Indian/Alaska Native, 6.2% Multiracial, non-Hispanic, and 0.7% Other, non-Hispanic. The mean household income was $27,720.28, and the mean income-to-needs ratio (i.e. family annual household income relative to national poverty guidelines) was 1.00.

Procedure

The Baby FACES team collected data regarding EHS children, families, primary teachers for selected children, and classroom quality over a five-month period during the spring of 2018. Parents completed a telephone interview in English or Spanish and provided information on

child and family characteristics (e.g., income, languages spoken in the home and to the child, and household members), program services received, and needs and resources, along with ratings of their children's and their own health status and well-being. In addition, parents completed a self-administered paper questionnaire regarding their child's language development and social-emotional development. This study focuses on data collected from the parent questionnaires.

Measures

Economic Hardship. Household income-to-needs ratio (INR) was used as the measure of economic hardship. INR reflects family annual household income relative to national poverty guidelines. To calculate this value, parent-reported annual income was divided by the 2018 federal poverty guideline. Scores of l or less are indicative of poverty.

Economic Pressure. The measure of economic pressure was adapted from the *Economic Strain Questionnaire* by Conger and Elder (1994). Adaptations by the study developers increased the specificity and applicability of the items for EHS families by changing the wording from *would like to have* in the original version to *have* in the version used in Baby FACES data collection. Four items assess the extent to which families agree that they *have* the money to afford the kind of home, clothing, food, and medical care they need. Items (e.g., "My family has enough money to afford the kind of home we need") are rated on a five-point scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). One item assesses the degree to which families have difficulty paying their bills each month over the past year on a five-point scale ranging from 1 (*a great deal of difficulty*) to 5 (*no difficulty at all*). This was altered from Conger et al.'s version, which asks about the past year in general without referring to each month. One item assesses the extent to which families earn enough money at the end of each month to make ends meet. This item was adapted by increasing the response scale from four to five possible options, ranging

from 1 (*not enough to make ends meet*) to 5 (*more than enough money left over*). The last two

items on the measure were reverse-coded, and all six items were summed to create a global

measure of economic pressure, an approach similar to that used by Newland et al. (2013). Higher

scores on this measure reflect that families are experiencing greater economic pressures. Internal

reliability for the measure was very good (Cronbach's α = .84).

Household Chaos. The *Confusion, Hubbub, and Order Scale* (CHAOS; Matheny et al.,

1995) was used to assess the level of confusion and disorganization in the child's home

environment. The CHAOS scale contains 15 items that are evaluated on a four-point scale

ranging from 1 (*very much like your own home*) to 4 (*not at all like your own home*). Example

items include "we almost always seem to be rushed" and "we can usually find things when we

need them." All items were re-coded so that higher ratings represent more chaotic, disorganized,

and hurried homes. Internal reliability for the measure was adequate (Cronbach's α = .77).

Parental Depressive Symptoms. The *Center for Epidemiologic Studies Depression*

Scale-Revised (CESD-R; Eaton et al., 2004) was used to measure depressive symptoms in

parents. A revised version of the full CESD, the CESD-R is a 20-item self-administered

screening tool to identify symptoms of depression or psychological distress. Parents reported the

frequency of symptoms in the past week on a five-point scale ranging from 0 (*less than one day*)

to 4 (*nearly every day for two weeks*). Example items include "I had trouble keeping my mind on

what I was doing" and "Nothing made me happy." The total scores for the scale range from 0 to

5, with higher scores indicating higher frequency of depressive symptoms. The measure

demonstrated strong internal reliability (Cronbach's α = .91).

Parenting Stress. The *Parenting Stress Index, Fourth Edition, Short Form* (PSI-4-SF;

Abidin, 2012) was used to evaluate parenting stress in relation to the participating child. This 36-

item measure assesses areas of difficulty for parents when engaging with their children and is

acceptable for use with parents of children younger than age 12. Parents rated each of the items

on a five-point scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Items were re-

coded so that responses to all items indicated a higher level of parenting stress. The PSI-4-SF

includes three subscale scores (sum of items in each of the subscales), *Parental Distress* (amount

of distress parent is facing in parenting role; e.g., "Since having a child, I feel that I am almost

never able to do things that I like to do"), *Parent-Child Dysfunctional Interaction* (parent's

perception of ability to engage with their child; e.g., "Sometimes I feel my child doesn't like me

and doesn't want to be close to me"), and *Difficult Child* (manageability of the child's behaviors;

e.g., "My child reacts very strongly when something happens my child doesn't like"). The *Total*

Stress score, calculated from the sum of the three subscale scores, was used in analyses and

demonstrated strong internal reliability (Cronbach's $\alpha = .95$).

Parental Sensitivity. To assess parental sensitivity, the 10-item Parent-Child Interaction

subscale from *the Healthy Families Parenting Inventory* (HPFI; Krysik & LeCroy, 2012) was

used. The HFPI was designed for use with parents of young children and examines nine aspects

of parenting. The items in the Parent-Child Interaction subscale assess parents' responsiveness

and sensitivity to the child (e.g., parent responds quickly to child's needs, can tell what the child

needs) and interactions with their child (e.g., uses positive words to encourage child, praises

child). Items were rated by parents on a five-point scale, ranging from 1 (*rarely or never*) to 5

(*always or most of the time*). The total score was obtained by summing the items, with higher

scores indicating higher levels of responsiveness and sensitivity. The internal reliability for the

subscale was very good (Cronbach's $\alpha = .83$).

Social Support. To evaluate levels of social support available to families, the Social

Support subscale of the HFPI (Krysik & LeCroy, 2012) was used. The Social Support subscale

includes five items that measure parents' sense and level of connectedness with friends, family,

and community; it also measures the extent to which parents have been able to identify people or

resources that are available to help with challenges, stressors, or other life events. Items were

rated on a five-point scale, ranging from *rarely or never* to *always or most of the time*. The

subscale score is the sum of the items, with higher scores indicating higher levels of social

support. Internal reliability for the subscale was very strong (Cronbach's α = .91).

Parent-Child Closeness. The *Child-Parent Relationship Scale, Short Form* (CPRS-SF;

Driscoll & Pianta, 2011) is a questionnaire completed by parents to evaluate their perceptions of

their relationships with their child. It was developed for parents of children between ages three

and 15 but has also been shown to be reliable and valid for parents of younger children (Lange et

al., 2015). Items were rated on a scale from 1 (*definitely does not apply*) to 5 (*definitely applies*).

The CPRS-SF contains 15 items sorted into two subscales: Closeness and Conflict. However,

only the seven-item Closeness subscale was used in analyses (example item: "share an

affectionate, warm relationship"). Higher scores indicate higher levels of closeness. The internal

reliability for this subscale was adequate (Cronbach's α = .69).

Child Behavior Problems. The parent-report version of the *Brief Infant Toddler Social

Emotional Assessment* (BITSEA; Briggs-Gowan & Carter, 2006) was used to assess the

development of behavior problems in child participants. The BITSEA was designed to detect

possible delays in the acquisition of social-emotional competencies as well as social-emotional

and behavior problems in children between 12 to 36 months old; however, a previous iteration of

the Baby FACES project conducted in 2009 successfully used the BITSEA for children as young

as eight months and older than 36 months of age. The 42-item BITSEA focuses on the

development of competencies (e.g., "hugs or feeds dolls or stuffed animals") as well as problem

behaviors (e.g., "avoids physical contact"). Only the 31-item Problem subscale was used in

analyses. This subscale assesses social-emotional and behavioral problems, such as aggression,

defiance, overactivity, negative emotionality, anxiety, and withdrawal. Higher scores indicate

more problems. Internal reliability for the Problem scale was very good (Cronbach's α = .83).

Data Analysis Plan

Preliminary Analysis

Descriptive statistics and bivariate correlations were computed using SPSS version 27 to

identify general trends in the data and determine the strength of relationships between study

variables. Prior to conducting analyses to test study hypotheses, the data was examined for

assumptions of multivariate normality. Prior to moderation analyses, variables included in the

interaction terms were mean centered. Missing data was addressed with full information

maximum likelihood estimation and was at the scale rather than the item level. Finally, a child-

level weight that adjusted for sampling stratification and nonresponse bias was applied in SPSS

using the complex survey command to ensure that the present sample was representative of the

larger population of Head Start children, as is common in all Baby FACES data analyses.

Path Analysis to Test Study Hypotheses

Path analysis in R version 4.1.1 (R Core Team, 2021) was used to evaluate the cross-

sectional relationships between economic hardship, economic pressures, household chaos,

parental depressive symptoms, parental sensitivity, parenting stress, and child behavior

problems. To assess model fit, four separate indicators were examined: chi-square, root mean

square error of approximation (RMSEA), comparative fit index (CFI), and Standardized Root

Mean Square Residual (SRMR). Using different fit indices allows for estimation of goodness of fit for the full model, while not relying on any single indicator. Global goodness of fit is indicated by a non-significant chi-square, RMSEA < .06, CFI > .95, and SRMR < .08 (Hu & Bentler, 1999).

Path analysis is able to assess the fit of the full model as well as examine the direct and indirect effects of specific model pathways. The *lavaan* package (Rosseel, 2012) in R uses maximum likelihood (ML) to estimate the parameters that best fit the available raw data. Two path models, the hypothesized model and an alternative model, were tested examining the indirect effect of poverty (as conceptualized as economic hardship and economic pressures) on child behavior problems. In the hypothesized model (see Figure 1), economic hardship was set as an exogenous variable predicting economic pressures. Economic pressure was an endogenous variable predicting household chaos, parental depression, and parenting stress. These variables were set to predict parental sensitivity, which, in turn, predicted child behavior problems. The alternative model (Figure 2) was similar to the first; however, instead of household chaos, parental depression, and parenting stress predicting child behavior problems through parental sensitivity, each of those variables was set to predict child behavior problems in parallel with parental sensitivity. To make comparisons between the hypothesized model and alternative model and determine which model was a better fit to the data, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) fit statistics were analyzed. Lower values indicate better fit.

To assess indirect effects within the model, a bootstrapping approach was employed (n = 5,000 bootstrap samples; Preacher & Hayes, 2008). This approach produces estimates of the standard errors of parameter estimates and a bias-corrected confidence interval of the indirect

effects. Thus, the indirect effects of poverty on child behavior problems through the proximal

factors were evaluated based on the size of the effect and its 95% bias corrected bootstrap

confidence interval. The effects were considered statistically significant if the confidence interval

did not contain zero.

Additionally, to test the moderating effect of social support on the pathway between

economic pressures and parental depression, and the moderating effect of parent-child closeness

on the pathway between household chaos and parental sensitivity, the hypothesized and

alternative path models were run a second time, including interaction terms for each moderating

effect. These interaction terms were created by multiplying the predictor variables together. For

significant interaction terms, simple slopes analysis was conducted to determine the effects of

economic pressure and household chaos at high and low values of their respective moderators.

Results

Descriptive Statistics and Correlations

Table 1 presents correlations, means, SDs, and ranges for the key variables in the study.

The mean household income for the sample was $27,720, and the mean income to needs ratio

was 1, indicating mean income was at the poverty level. Respondents were primarily birth

mothers ($N = 2128$), followed by birth fathers ($N = 121$), while the rest of responses were

provided by a non-birth parent, grandparent, or other guardian ($N=100$). Eight percent of

respondents ($N = 205$) reported clinically significant levels of depression.

All correlations were in the expected direction. Economic hardship was negatively

associated with economic pressure. Economic pressure was positively associated with parental

depression, parenting stress, household chaos and child behavior problems. It was negatively

associated with parental sensitivity. Parental depression, parenting stress, and household chaos

were positively associated with child behavior problems, while parental sensitivity was negatively associated with child behavior problems. Social support was negatively associated with parental depression. Parent-child closeness was negatively associated with household chaos and child behavior problems.

Path Analysis

      Hypothesized Model. The primary study hypothesis was that economic hardship would have an impact on child behavior problems through its association with economic pressure, which, in turn, would predict three proximal risk factors: parental depression, household chaos, parenting stress, and parental depression. These proximal factors would be associated with parental sensitivity, which would predict child behavior problems. Therefore, direct and indirect effects of these pathways of these pathways were tested simultaneously. The fit indices for this model indicated poor fit, $\chi^2(33) = 1012.31$, $p < .001$; RMSEA = .14, 90% CI [.13,.14]; CFI = .600; SRMR = .125. Therefore, significant pathways should be interpreted with caution.

      The unstandardized and standardized direct pathway coefficients for the hypothesized model are provided in Table 3. Figure 2 depicts the statistically significant directional pathways. Economic hardship significantly predicted economic pressure, such that families at or below the poverty line experienced greater economic pressure ($\beta = -.20$, $p < .01$). Economic pressure was predictive of the three proximal risk factors, parental depression ($\beta = .20$, $p < .001$), parenting stress ($\beta = .26$, $p < .001$), and household chaos ($\beta = .30$, $p < .001$), such that a greater number of pressures was associated with higher levels of the proximal risk factors. Two of the three proximal factors were associated with parental sensitivity. Higher levels of parenting stress and household chaos predicted lower levels of parental sensitivity ($\beta = -.38$, $p < .001$ and $\beta = .15$, $p <.001$, respectively). Surprisingly, parental depression was not significantly associated with

parental sensitivity (β = -.04, p = .15). Finally, parental sensitivity predicted child behavior problems, such that children with parents who were more sensitive to their needs were reported to exhibit fewer behavior problems (β = -.31, p < .001). R^2 values for the model are reported in Table 7.

The path analysis also revealed several significant indirect pathways, as shown in Table 4. Specifically, economic pressure was found to contribute to parental sensitivity through parenting stress and household chaos (β = -.10, 95% CI [-.11, -.07] and β = -.05, 95% CI [-.06, -.02], respectively). No significant indirect effect was found for economic pressure's impact on parental sensitivity through parental depression, as the 95% confidence interval contained zero (β = -.01, 95% CI [-.02, .002]). Analyses of the indirect pathways between the proximal risk factors and child behavior problems through parental sensitivity yielded significant indirect effects between parenting stress and child behavior problems and between household chaos and child behavior problems (β = .12, 95% CI [.03, .05] and β = .05, 95% CI [.04, .07], respectively). Parental depression did not have an indirect effect on child behavior problems through parental sensitivity, as the 95% confidence interval contained zero (β = .01, 95% CI [-.004, .03]).

Alternative Model. To clarify the role of parental sensitivity in shaping the development of children's behavior problems, an alternative model to the hypothesized model was tested. The fit indices for this model indicated poor fit, $\chi^2(32)$ = 1393.35, p < .001; RMSEA = .16, 90% CI [.16, .17]; CFI = .444; SRMR = .144. Therefore, significant pathways should be interpreted with caution.

The unstandardized and standardized pathway coefficients for the model are provided in Table 5. Figure 4 illustrates the statistically significant directional pathways. As in the hypothesized model, economic hardship significantly predicted economic pressure, Economic

hardship significantly predicted economic pressure, such that families at or below the poverty

line experienced greater economic pressure (β = -.20, p < .01). Economic pressure significantly

predicted all four proximal factors. Greater numbers of economic pressure were associated with

higher levels of parental depression (β = .20, p < .001), parenting stress (β = .26, p < .001), and

household chaos (β = .30, p < .001). There was an inverse relationship between economic

pressure and parental sensitivity, such that greater numbers of economic pressure predicted lower

parental sensitivity (β = -.23, p < .001). Two of the four proximal factors had a direct effect on

child behavior problems. Families who experienced higher levels of parenting stress reported

that their children experienced more behavior problems (β = .38, p < .001). Similar to the

hypothesized model, parental sensitivity significantly predicted child behavior problems, such

that children with parents who were more sensitive to their needs were reported to exhibit fewer

behavior problems (β = -.12 p < .001). The direct effects of parental depression and household

chaos on child behavior problems were not significant. R^2 values for the model are reported in

Table 7.

The path analysis also yielded several significant indirect pathways, as shown in Table 6.

Specifically, economic pressure was found to contribute to child behavior problems through

parenting stress and parental sensitivity (β = .10, 95% CI [.10, .16] and β = .03, 95% CI [.02,

.06], respectively). No significant indirect effect was found for economic pressure's impact on

parental sensitivity through parental depression or household chaos, as the 95% confidence

interval contained zero (β = .001, 95% CI [-.01, .01] and β = .01, 95% CI [-.01, .03],

respectively).

Moderation Analyses

Hypothesized Model. The interaction between economic pressure and social support significantly predicted parental depression ($\beta = -.11$, $p < .05$). Simple slopes for the association between economic pressure and parental depression were tested for low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of social support. Each of the simple slope tests revealed a significant positive association between economic pressure and parental depression, but economic pressure was less strongly related to parental depression in the context of high ($\beta = .39$, SE = .04, $p < .001$) compared to moderate ($\beta = .29$, SE = .03, $p < .001$) or lower ($\beta = .18$, SE = .04, $p < .001$) social support (see Figure 5). Parent-child closeness did not have interactive effects with household chaos in predicting parental sensitivity ($\beta = .02$, $p = .67$).

Alternative Model. The interaction between economic pressure and social support significantly predicted parental depression ($\beta = -.11$ $p < .05$). Simple slopes analysis revealed the same pattern as in the hypothesized model. A significant positive association between economic pressure and parental depression was observed, but economic pressure was less strongly related to parental depression in the context of high social support high ($\beta = .39$, SE = .04, $p < .001$) compared to moderate ($\beta = .29$, SE = .03, $p < .001$) or lower ($\beta = .18$, SE = .04, $p < .001$) social support (see Figure 5). Parent-child closeness did not interact with household chaos to predict child behavior problems ($\beta = .01$, $p = .84$).

Model Comparison

The AIC was 64,006.19 for the hypothesized model and 64,389.22 for the alternative model. The BIC was 64,103.20 for the hypothesized model and 64,491.63 for the alternative model. Since smaller numbers indicate better model fit, the hypothesized model had slightly better fit to the data than the alternative model.

Discussion

The current study investigated the relationship between poverty and behavior problems in infancy and toddlerhood in a low-income sample of children and families recruited from Early Head Start (EHS) programs. Guided by the Family Stress Model, this study is the first to examine whether poverty, conceptualized as economic hardship and economic pressure, contributes to the development of behavior problems indirectly through four family-based risk factors: parental depression, parenting stress, household chaos, and parental sensitivity. Using Ecological Systems Theory as a theoretical framework, parental sensitivity was conceptualized as a potential mediator through which the other three risk factors contribute to behavior problems. Additionally, parental social support and parent-child closeness were tested as moderators of the effects of poverty on parental depression and household chaos on behavior problems, respectively.

Despite poor model fit, the hypothesized model yielded many significant direct and indirect pathways, providing support for the Family Stress Model in early childhood. In support of Hypothesis 1, significant direct effects were observed from economic hardship to economic pressure. Consistent with prior studies of the Family Stress Model, this finding indicates that families with larger financial deficits have greater difficulty meeting basic needs (food, clothing, etc.), paying bills each month, and making ends meet (Gard et al., 2020; Masarik & Conger, 2017). Increased economic pressure was also associated with higher levels of parental depression, parenting stress, and household chaos. This suggests that challenges in meeting basic needs may contribute to additional strain on the family, which may precipitate difficulties within the family system, such as negative effects on parental mental health, parenting, and household organization. These findings align with previous research that has demonstrated the impact of

economic pressure within the Family Stress Model. For example, in a study of children between ages six and 15, greater economic pressure was associated with increased levels of maternal depressive symptoms and parenting stress in the form of feelings of being unable to meet both their children's basic and "extra" needs (e.g., funds for fields trips, holiday presents; Mistry et al., 2008). This suggests that parents may judge their effectiveness of being able to provide for their children on criteria greater than simply meeting their basic needs, and their perceived failure in doing so may influence their mental health and stress they experience in parenting.

Consistent with Hypothesis 2, parenting stress and household chaos had a direct association with parental sensitivity, indicating that parents may be less attuned and responsive to their child's needs if they experience significant stress in their role as a parent and disorganization within the home environment. This is in line with previous studies of parents of infants and toddlers that have linked reduced parental sensitivity to parenting stress (Ward & Lee, 2020) and household chaos (Mills-Koonce et al., 2016). Contrary to Hypothesis 2, however, parental depression did not have a direct effect on parental sensitivity. This finding was surprising given that a large body of research has linked parental depressive symptoms to child behavior problems (see Goodman et al., 2011 for a review) and maladaptive parenting (Kiernan & Huerta, 2008; Pinquart, 2017). Specifically, research has demonstrated that depressed mothers often display less warmth, empathy, engagement, and emotional responsivity with their children than non-depressed mothers (Feng et al., 2007; Lovejoy et al., 2000; Silberg & Rutter, 2002; Turney, 2011). A possible explanation for this finding is that the present study was limited by a restricted range of parental depression, as only 8% of the sample reported clinical levels of depression. Therefore, it may be beneficial for future research to examine relations among

parental depression, parental sensitivity, and child behavior problems in a sample that includes a larger proportion of mothers with elevated depressive symptoms.

Hypothesis 3 was partially supported, as parental sensitivity was found to mediate the relationship between two of the three proximal risk factors (parenting stress and household chaos, but not parental depression) and child behavior problems. This suggests that parents who feel overwhelmed by parenting and household responsibilities may be less sensitive to their children's needs, which may contribute to child behavior problems. In line with previous research (Mills-Koonce et al., 2016), these findings are not surprising, as households with high levels of chaos and stress tend to be less organized and structured, as well as noisier and more cluttered, which may make it challenging for parents to devote adequate time and energy to remain attuned to their children. In turn, children may act out due to feeling that their parents are not being sensitive to their needs. Although it is surprising that an indirect effect involving parental depression was not observed, it may be useful to view this through the lens of Ecological Systems Theory. Specifically, parental depression focuses exclusively on parents' levels of psychological symptoms and thus may be relatively distal in its relationship with the child. In contrast, household chaos may have a more direct relationship to the child's immediate environment (e.g., crowding, organization). The same may be true for the measure of parenting stress, which examines parental perceptions of their interactions with their child in the context of their child's intrinsic characteristics (e.g., temperament). Since parenting stress and household chaos are more proximal to the child, it is possible that they are better predictors of parents' sensitivity to their child's needs.

Consistent with Hypothesis 4, social support moderated the relation between economic pressure and parental depression, indicating that social support may serve as a buffer against

negative effects of economic pressure on parental mental health. This result is consistent with

findings from Taylor et al. (2012) of a moderating effect of kin social support in a sample of

mothers of adolescents. Social support may reduce the effects of economic pressure on parental

depression by reassuring parents they are not enduring the stress of poverty alone and have

resources available to them to overcome challenges. In the future, it may be interesting to

examine whether the benefits of social support depend on the type of support (e.g., social

connections, providing information about available resources, or helping address challenges) or

the source of support (e.g., partner, parents, etc.).

No support was found for Hypothesis 5, as parent-child closeness did not moderate the

association between household chaos and parental sensitivity. It is possible that parent-child

closeness on its own is insufficient to overcome the impact that a chaotic household can have on

a parent's ability to engage in sensitive parenting. Chaos within the home may also interfere with

the parent-child relationship, such that parents do not feel close with their children. Since this

study was the first to evaluate a potential moderator of the relation between household chaos and

parental sensitivity, further research is needed to examine other factors that may be protective.

One such factor may be parental monitoring, as parents who are able to invest more time into

supervising their children and tracking their behavior may be able to respond more effectively to

their children's needs. It may also be worthwhile to investigate the role of attachment style,

which is thought to be central to the development of a healthy parent-child relationship so that

children feel safe, secure, and protected.

A competing, alternative model was also tested to determine if the proximal risk factors

contributed independently to child behavior problems instead of indirectly through parental

sensitivity. Both the hypothesized and alternative models demonstrated poor global fit to the

data, indicating that there are additional pathways not reflected in the models that contribute to

the relationship between poverty and child behavior problems. However, the AIC and BIC fit

statistics, which are two indices used to compare models that are not nested, indicated slightly

better fit for the hypothesized model over the alternative one, showing that the former is more

descriptive of the study data. This suggests that the indirect pathway through parental sensitivity

contributed to the better fit, since it was the major point of difference between the models.

Analyses indicated similar effects in the alternative model as the hypothesized model, including

direct effects of economic hardship on economic pressure and of economic pressure on the

family-based risk factors. A direct effect of economic pressure on parental sensitivity was also

observed, such that greater pressure predicted lower sensitivity. Parental sensitivity and

parenting stress had significant direct effects on child behavior problems, while household chaos

and parental depression did not. Therefore, the relation between parenting stress and child

behavior problems may be more complex than what is captured by the hypothesized and

alternative models separately, as these models provided support for direct and indirect effects,

respectively.

Summary and Future Directions

Taken together, the hypothesized and alternative models provide support for the Family

Stress Model and Ecological Systems Theory by highlighting how the effects of poverty may be

transmitted through various family and environmental systems to influence child behavior

problems. This builds on research examining the Family Stress Model because it is one of the

few studies to apply the model to infancy and toddlerhood, stages during which family-related

processes tend to be more impactful in child development. Additionally, research on the Family

Stress Model has more often tested individual pathways rather than complex models with several

indirect pathways (e.g., Linver et al., 2002; Scaramella et al., 2008; Yeung et al., 2002). The present study was also the first to compare two competing adaptations of the Family Stress Model in order to elucidate the relation between parenting and other proximal risk factors.

Of note, there was support for the indirect effect of parenting stress on child behavior problems through parental sensitivity in the hypothesized model and support for a direct effect of parenting stress on child behavior problems in the alternative model. These findings suggest that parenting stress plays an important role in explaining the relationship between poverty and parental sensitivity and that parental sensitivity is a critical factor in understanding how proximal family-based factors contribute to the development of behavior problems. Additionally, the significant indirect effect found for household chaos in the hypothesized model, combined with the lack of a significant direct effect in the alternative model, provides support for household chaos operating indirectly through parental sensitivity. Among the many consequences associated with poverty is its negative effect on parenting stress and the family environment, which can weaken a parent's ability to respond to their children in a sensitive manner.

Future research should aim to elucidate these pathways further by examining other family processes and factors that may be especially relevant for parents in poverty, such as parental monitoring and harsh parenting. Research has shown that parents who have a low socioeconomic status spend more time away from home, as they work longer hours and more irregular schedules to make ends meet (Hseh & Yoshikawa, 2007). In turn, these parents may have limited opportunity to monitor their children, which has previously been shown to be a risk factor in the development of behavior problems in school-age children (Kilgore et al., 2000) and adolescents (Pettit et al., 2001). Evidence also suggests that parents experiencing economic hardship may be more likely to feel frustrated and irritable, which can carry over into the parent-child relationship

in the form of harsh, explosive parenting (Simons et al., 2020) that can contribute to the development of child behavior problems (Deater-Deckard et al., 2012; Machenbach et al., 2014). Therefore, harsh parenting should be evaluated within the context of the Family Stress Model to examine its contributions to behavior problems in conjunction with other proximal factors.

Strengths and Limitations

The present study has several strengths. One strength is its extension of the family stress model to infants and toddlers, as much of the previous research has focused on older children and adolescents. Another strength is the inclusion of fathers and other caregivers, as previous studies have primarily been limited to mothers. By including fathers and other caregivers, this study examined family processes from the perspective of caregivers more broadly. Future studies can further expand knowledge of these processes through the inclusion of multiple caregiver reporters in order to compare models by caregiver type (e.g., mothers vs. fathers), as research has shown that family processes may differ between caregivers (Yaffe, 2020). Another strength of the present study was its use of a large, diverse sample. This sample is reflective of EHS families within the United States, thus making the results generalizable to this population. Future research would benefit from analyzing the models outlined in this present study by racial/ethnic group to examine the potential for cultural differences in the application of the Family Stress Model.

It is also important to acknowledge several limitations of the present study. For example, because a cross-sectional design was used, inferences about directionality cannot be made. It is certainly possible that parents of children with behavioral problems will experience parenting stress and find it more difficult to be sensitive to their needs and maintain structure and organization within the household. A longitudinal design with data from three time points is especially ideal when examining mediation (Maric et al., 2012) and would be important for

examining pathways from poverty to child behavior problems over time. In addition, longer-term studies that begin in infancy and toddlerhood and periodically assess family factors and child outcomes at later time points can help determine if pathways in place early in development have effects across developmental periods. Furthermore, the present study relied exclusively on parent report data from one caregiver. This is a significant limitation given concerns about common method variance. Future studies should incorporate both parent-report and observational methods of parenting behaviors in light of documented discrepancies between these methods (Herbers, Garcia, & Obradović, 2017).

Finally, while the present study used a path analysis approach to elucidate the relations among poverty, family processes, and child behavior problems, there may have been advantages to examining a latent variable model. Research indicates that the family processes and risk factors that operate within the Family Stress Model are dimensional and that different aspects of these dimensions may contribute differently to the development of behavior problems (Barnett, 2008; White et al., 2015). Therefore, future studies should consider using latent factor models to examine how multiple risk factors and multiple measures of these factors within each dimension (e.g., parenting, parental mental health, home environment, etc.) may function within the Family Stress Model. For example, the present study focused on one aspect of the parenting domain, parental sensitivity, but future studies would benefit from understanding the contributions of parental sensitivity relative to other parenting behaviors, such as parental monitoring, harsh discipline, and overcontrol. In addition, research has shown that two aspects of household chaos, instability and disorganization, may differentially contribute to the development of child behavior problems (Mills-Koonce et al., 2016) and so a model that examines their relative effects may advance our understanding of the role of household chaos.

Implications for Prevention and Intervention

Findings from this study may highlight potential targets for prevention and early intervention programs for children and families living in poverty. For example, these findings lend support to using strategies that aim to increase parental sensitivity and reduce parenting stress in an effort to prevent and reduce behavior problems in young children. This is in line with previous research showing that parenting interventions can increase parental sensitivity (Perrone et al., 2021) and reduce parenting stress (Burgdorf et al., 2019; Price et al., 2015) and that reductions in parenting stress are associated with decreases in child behavior problems (Moreland et al., 2016).

Additionally, as household chaos was shown to have an indirect effect on child behavior problems through parental sensitivity, interventions that seek to reduce household chaos may be beneficial. Working with families to manage the home environment can provide opportunities for parents to develop a more responsive parenting style that can alter trajectories toward the development of behavior problems in their children. Because parenting interventions typically focus on parenting rather than household management strategies specifically, future research should examine the potential impact of incorporating strategies to address household chaos. To date, there has been limited research in this area, though studies suggest that interventions that help parents establish family routines, create schedules, reduce noise, and organize materials may be effective in reducing harsh parenting (Andreweg et al., 2022) and improving parent and child well-being (Brooks-Gunn, Johnson, & Leventhal, 2010; Weisner, 2010). Addressing chaos within the home environment may also reduce feelings of stress and uncertainty that arise from the chaotic environment and thereby enhance the feasibility and effectiveness of implementing parenting-based interventions at home (Deater-Deckard et al., 2009).

Lastly, findings from the present study showing the protective benefits of social support reinforce that parents living in poverty would likely benefit from interventions that build their support networks. Indeed, research evaluating social support interventions for parents has demonstrated that peer support is effective in reducing depressive symptoms, particularly in parents of newborn and very young children (Leger & Letourneau, 2015). Support can include social connections who offer encouragement and help parents feel that they are not alone in dealing with stress, information about available opportunities and resources, and help with addressing stressors directly (e.g., housekeeping). Future research should examine the effectiveness of existing social support interventions within EHS populations.

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Appendix 1. Tables

Table 1

Correlations and descriptive statistics for study variables of interest

Variables	1	2	3	4	5	6	7	8	9
1.Economic Hardship	--								
2. Economic Pressure	-.210**	--							
3. Parental Depression	-.044*	.272**	--						
4. Parenting Stress	-.099**	.270**	.365**	--					
5. Parental Sensitivity	.088**	-.221**	-.248**	-.500**	--				
6. Household Chaos	-.079**	.312**	.366**	.343**	-.309**	--			
7. Behavior Problems	-.086**	.139**	.183**	.437**	-.325**	.185**	--		
8. Social Support	.117**	-.287**	-.310**	-.389**	.373**	-.234**	-.186**	--	
9. Parent-child Closeness	.087**	-.086**	-.087**	-.249**	.386**	-.131**	-.201**	.191**	--
Mean	1	8.3	4.8	59.38	45.55	10.25	10.76	21	30.98
SD	0.9	5.18	7.52	18.79	4.74	5.9	6.7	4.74	3.99
Range	0-20	0-24	0-57	36-175	18-50	0-41	0-55.8	18-50	7-35

*p<.05 **p<.01

Table 2

Global goodness of fit indices for the hypothesized and alternative models. Good fit is indicated by a non-significant chi-square, RMSEA<0.06, CFI>0.95, and SRMR <.08 (Hu and Bentler, 1999). AIC and BIC values for model comparison. Smaller values indicate better fit.

	Fit Indices	Value		Fit Indices	Value
Hypothesized Model	Chi-Square	1012.31, *p*<.001	Alternative Model	Chi-Square	1393.35, *p*<.001
	RMSEA	0.135 [.13,.14]		RMSEA	0.162 [.16,.17]
	CFI	0.600		CFI	0.444
	SRMR	0.125		SRMR	0.144
	AIC	64006.19		AIC	64389.22
	BIC	64103.20		BIC	64491.63

Table 3

Unstandardized and standardized direct pathway coefficients for the hypothesized model

	B	SE	β
Economic Hardship→ Economic Pressure (A)	-1.07**	.37	-.20
Economic Pressure→Parental Depression (B)	.28***	.04	.20
Economic Pressure→Parenting Stress (C)	.94***	.09	.26
Economic Pressure→Household Chaos (D)	.35***	.03	.30
Parental Depression→Parental Sensitivity (E)	-.03	.01	-.04
Parenting Stress→Parental Sensitivity (F)	-.09***	.01	-.38
Household Chaos→Parental Sensitivity (G)	-.12***	.02	-.15
Parental Sensitivity→Child Behavior Problems (H)	-.46***	.03	-.31

*p<.05 **p<.01***p<.001

Table 4

Unstandardized and standardized indirect pathway coefficients for the hypothesized model

	B	*SE*	*β*	95% CI
Economic Pressure→Parental Depression→ Parental Sensitivity (BE)	-.01	.01	-.01	-.02-.002
Economic Pressure→Parenting Stress→Parental Sensitivity (CF)	-.09***	.01	-.10	-.11-̄.07
Economic Pressure→Household Chaos→Parental Sensitivity (DG)	-.04***	.01	-.05	-.06-̄.02
Parental Depression-> Parental Sensitivity-> Child Behavior Problems (EH)	.01	.01	.01	-.004-0.03
Parenting Stress -> Parental Sensitivity-> Child Behavior Problems (FH)	.04***	.01	.12	.03-.05
Household Chaos-> Parental Sensitivity-> Child Behavior Problems (GH)	.05***	.01	.05	.04-.07

*p<.05
**p<.01
***p<.001

Table 5

Unstandardized and standardized direct pathway coefficients for the alternative model

	B	*SE*	*β*
Economic Hardship→ Economic Pressure (A)	-1.07**	.37	-.20
Economic Pressure→Parental Depression (B)	.28***	.04	.20
Economic Pressure→Parenting Stress (C)	.94***	.09	.26
Economic Pressure→Parental Sensitivity (D)	-.21***	.02	-.23
Economic Pressure→Household Chaos (E)	.35***	.03	.30
Parental Depression→ Child Behavior Problems (F)	.01	.02	.01
Parenting Stress→ Child Behavior Problems (G)	.13***	.01	.38
Parental Sensitivity→Child Behavior Problems (H)	-.17***	.04	-.12
Household Chaos→ Child Behavior Problems (I)	.02	.03	.02

*p<.05
**p<.01
***p<.001

Table 6

Unstandardized and standardized indirect pathway coefficients for the alternative model

	B	*SE*	*β*	95% CI
Economic Pressure→Parental Depression→Child Behavior Problems (BF)	.002	.01	.001	-.01-.01
Economic Pressure→Parenting Stress→ Child Behavior Problems (CG)	.13***	.01	.10	.10-.16
Economic Pressure→Parental Sensitivity→Child Behavior Problems (DH)	.04***	.01	.03	.02-.06
Economic Pressure→Household Chaos→Child Behavior Problems (EI)	.01	.01	.01	-.01-.03

*p<.05
**p<.01
***p<.001

Table 7

R² values for the hypothesized and alternative models

Predictor	Hypothesized Model R^2	Alternative Model R^2
Economic Pressure	0.04	0.04
Parental Depression	0.12	0.12
Parenting Stress	0.07	0.06
Parental Sensitivity	0.27	0.05
Household Chaos	0.09	0.09
Child Behavior Problems	0.10	0.17

Figure 1

Conceptual hypothesized model
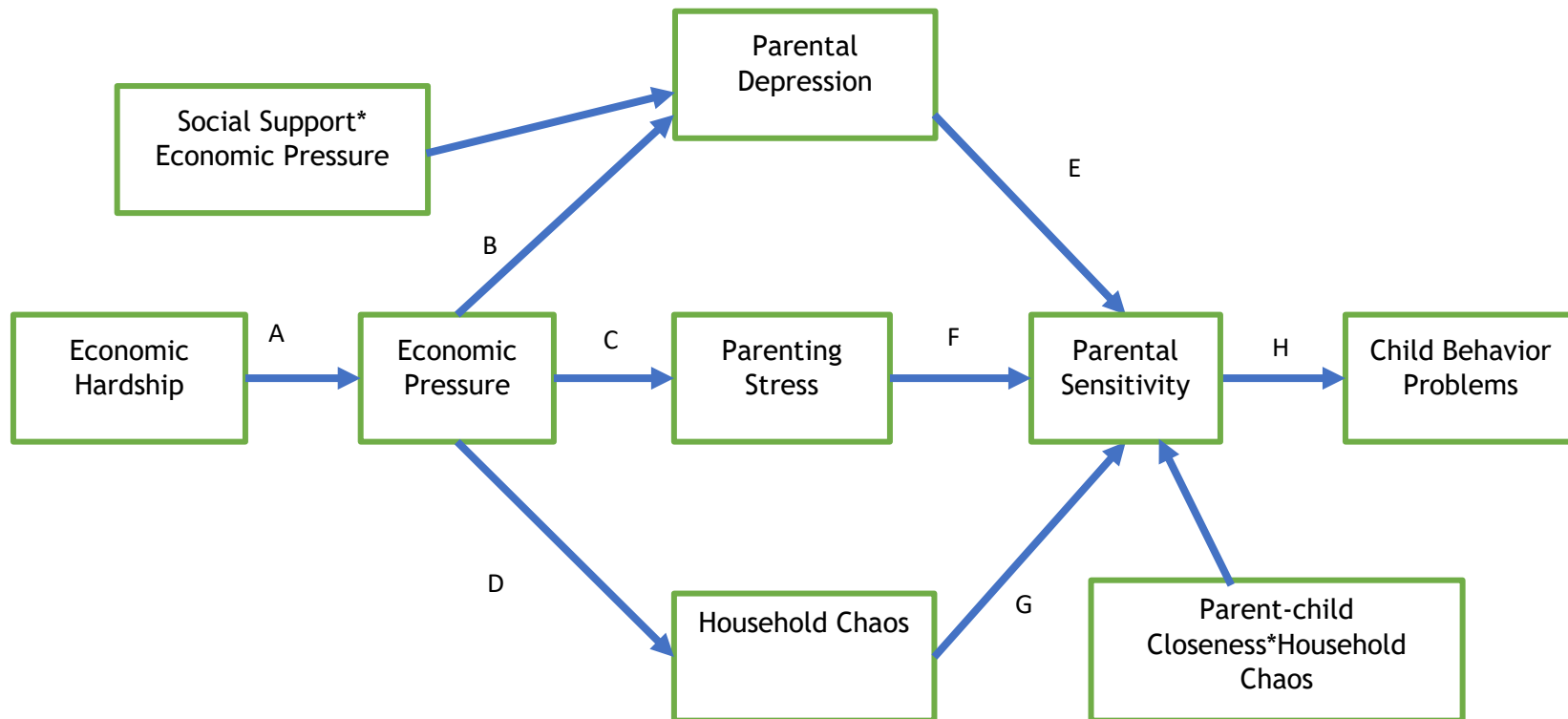
Figure 2

Final Hypothesized Model Depicting Significant Pathways
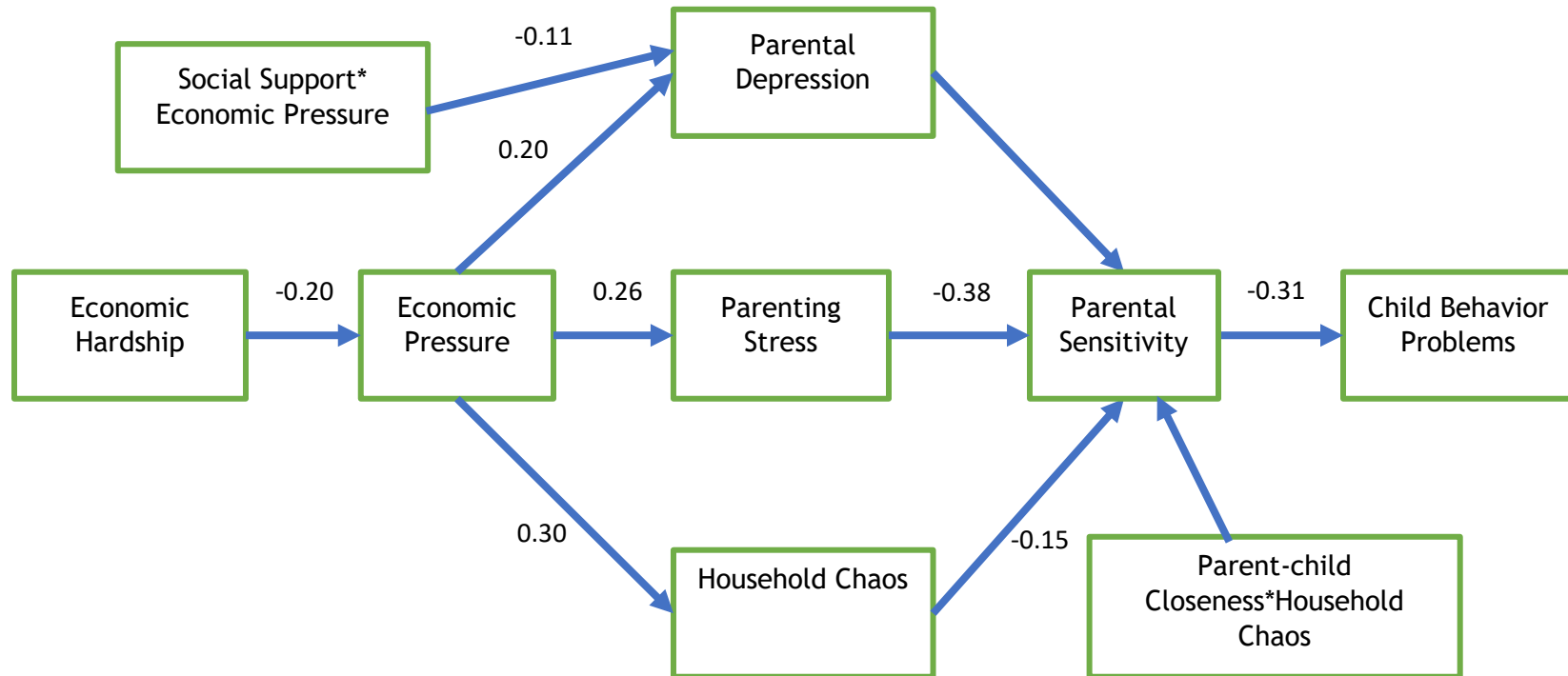
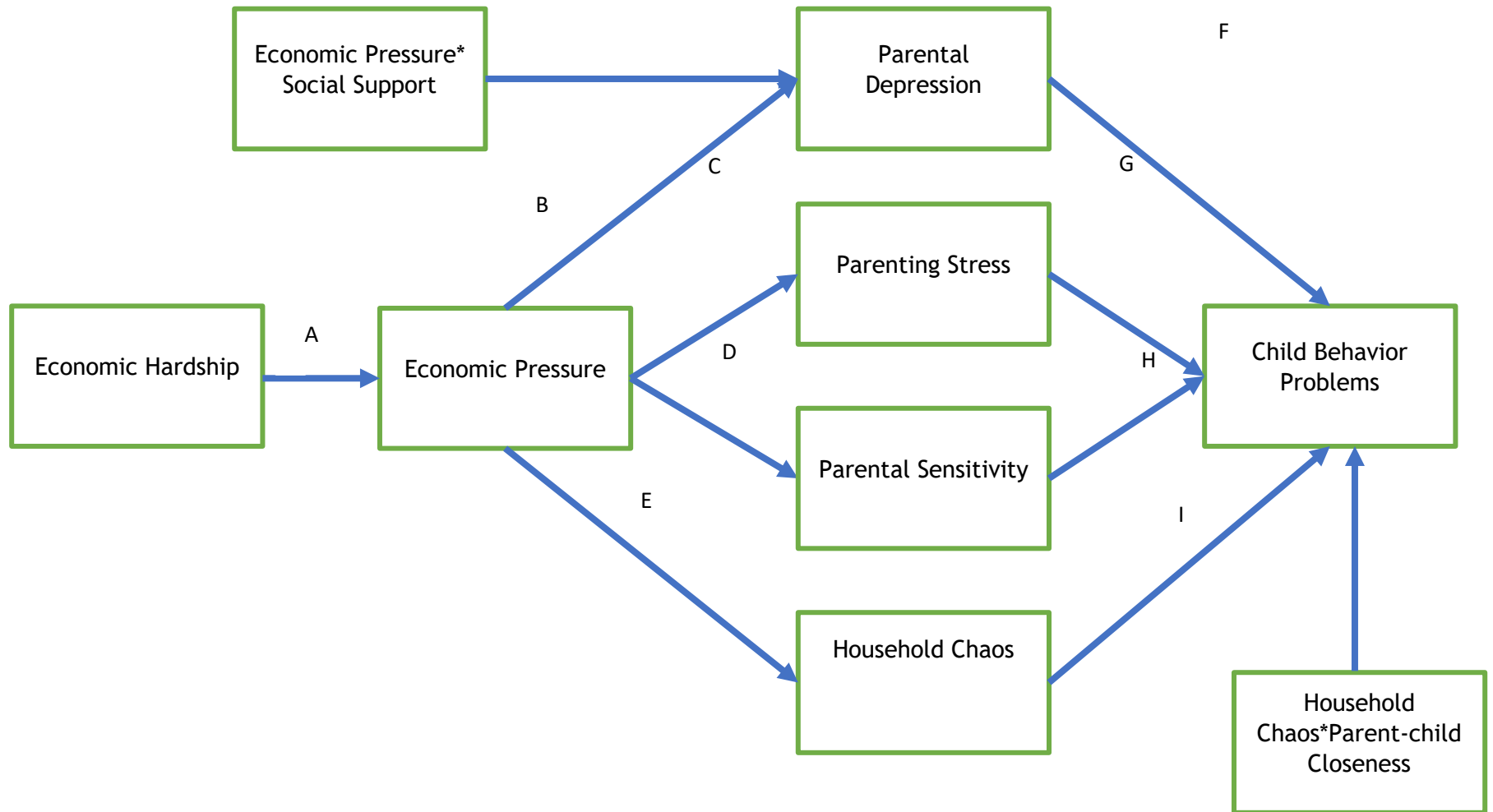**Figure 3**

Conceptual alternative model

Figure 4

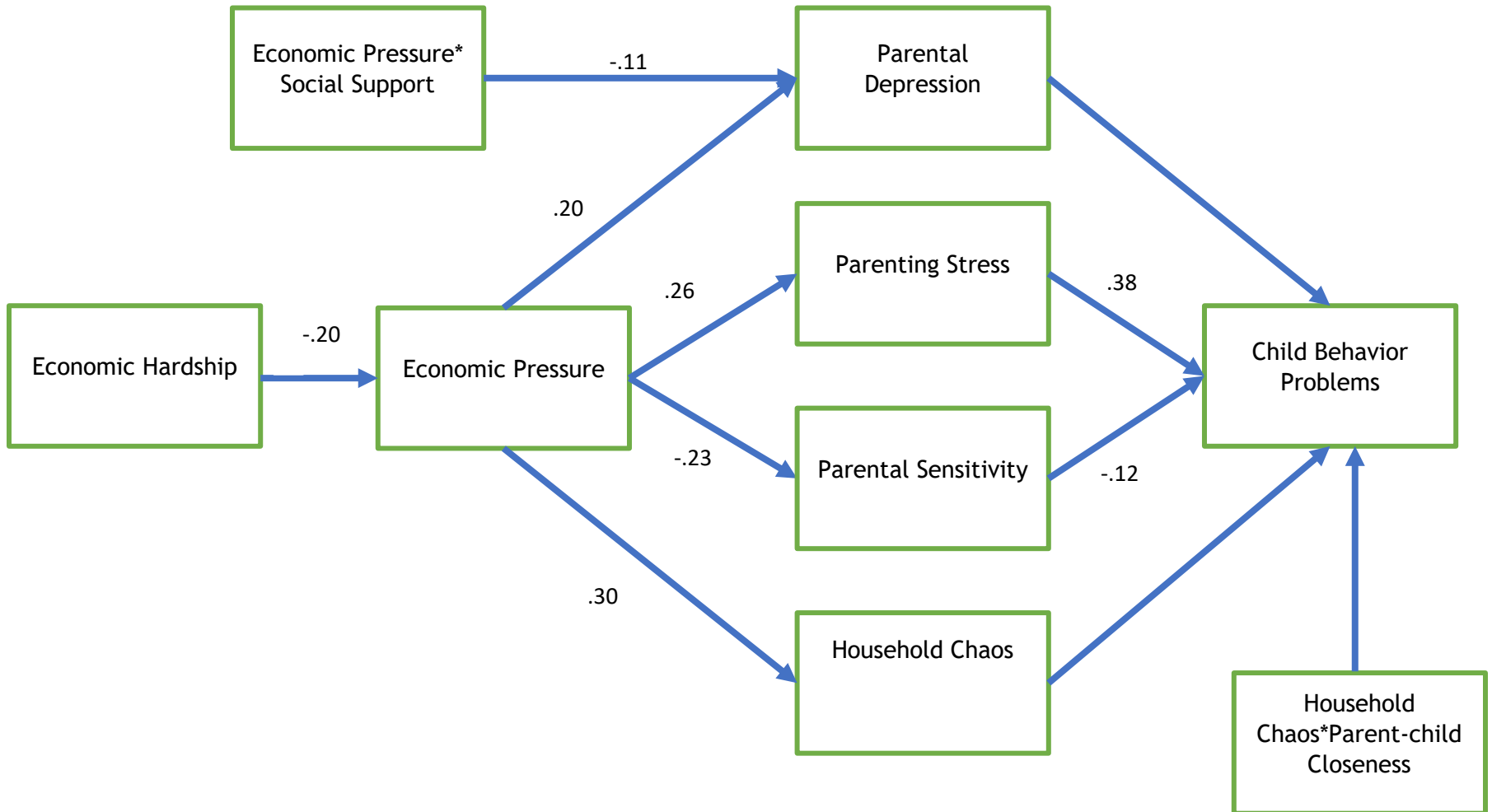*Final alternative model depicting significant pathways*

Figure 5

Plot of Significant Interaction between Economic Pressure and Social Support Predicting Parental Depression for the Hypothesized and Alternative Models